Prospects on Innovating Organizations

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SUMMARY

1. Dynamic Marketing

1.1. Principles

The creation of products and/or services passes by a true partnership connecting the creativity of the manufacturer or service provider with the customer requirements rising from the practice from his business or a use repeated in its particular context. The partnership is accompanied by a mutual training like W.G. Walker describes it in a report of the RAND CORPORATION of 1993 (1): it consists in making go up the customer requirements on the level of the function concerned and having the results of the reflection, operated within this function, proceeding to the operational level ; it is well there the role which has to play the knowledge management seen under a dynamic angle not of collection and storage but of circulation and exchanges, concept that one finds in the work of C. Blanc and T. Breton entitled "Le Lièvre et la Tortue" (2) which describes a reactive organization in which networks of immaterial activities are enabled; the function in question is related generally to design but it can be as well an administrative , commercial or technical one since it has effects on the appreciation of the customer with respect to a product or a service. It should be noted that a certain trend is observed today to induce research leaving its pigeon-hole and to encourage the researchers to carry out training courses with marketing to even visit the customers to study the problems hands on . It is well what said in other words François Dalle in "Le Sursaut" (3) in connection with his understanding of the life of the contractor: "One goes on the field without respite, in the stores, with the saleswomen, one puts in contact the commercial people with theresearchers". Today, there

is Internet but nothing replaces the direct contact, it never should be forgotten.

Nevertheless, Internet makes it possible to better handle the data as those which collects, for example, Apple which makes the most of the requests carried out on hot-line, Levi Strauss which uses the data of industrial measurement or Kellog which studies the requests for dietetic information, as indicates it R. McKenna in an article of "Harvard Business Review", entitled "Real Time Marketing" (4); one can just as easily quote the manufacturers of vehicles which provide to their dealers a computerized assistance with the diagnosis of breakdowns and which learn from them the lessons necessary to the improvement of their products. The organization in network makes it possible the various stakeholders to dialogue as early as the stage of design of the product and even, in certain cases, during its use, which makes it possible to design and possibly modify the product in connection with the customer; that also makes it possible to conceive the means of production with the operators who will have to use them and to train these operators in connection with the designers. The designer (or the design team) is placed in the center of an informational device which puts him in relation with the end-user and the manufacturing operator. That enables him to develop a virtual product, a virtual machine (or a process of manufacturing), tools of assistance and of training of operators. In order to avoid any ambiguity thereafter, let us specify that when we speak about organization in network, we refer to as well only one company comprising various centers of profit or autonomous units as a number of distinct companies working together on a contractual basis and taking up quite precise duties, some of them being able even to exert the same function and to enter in competition, as it is the case in the market places.

Moreover, the innovation does not develop within the strict limits of a given function possibly constituting, at a given moment, a point of focusing but is diffuse through the very whole organization with the proviso of finding there a climate favorable carefully prepared and maintained by every direction and more

particularly by omnipresent Human Resources Officers; the staff is then characterized, as we recommend it in our work entitled "L'entreprise délocalisée" (5), by "his aptitude to work in team, to act and report, to get information and inform, learn and teach, listen and dialogue with his colleagues, to be able to create, maintain and develop his own network of relations". The problem consists in collecting the ideas of innovation to implement them within the adequate function, whatever their origin and that by an incremental development inspired of the "kaizan" appraised by Japanese people. According to Walker, in his report of the RAND Corporation, this joint development is at variance with the" take or leave it" attitude when a manufacturer speaks to a customer or the "show and tell"one when a foreman speaks to an operator. That can involve particular organizations; Russel L. Ackoff in "The democratic corporation" (6) gives an example of it: in the circular organization, the decisions are made by committees not exceeding ten people including the person in charge and his collaborators and, with only one advisory vote, the direct superior of the person in charge; according to the order of the day, the committee can invite various people (suppliers, customers, expert and so on); these committees function in a democratic way insofar as the person in charge for the committee is subjected to control for the members.

Within the framework of the promotion of the innovation, by the Group Solvay , Herve Azoulay, Etienne Krieger and Guy Poullain describe, in their work "De l'entreprise traditionnelle à la start-up, les nouveaux modèles de développement" (7) , the role reserved for the "innov' acteurs" delegated by the various entities of the group in France. "... the innov' acteurs represent many trades (production, engineering departments, research, commercial, legal, human resources...), of the different hierarchical levels... ". "The innov' acteurs and their network...were the creators and the promoters of an on-line management tool on Internet of the ideas put forward in various sites." Their activity results in transverse exchanges, work groups, the ones in order to share experiments, the others to make technological surveys and to maintain the relations with external partners. This is why one speaks

about "participative innovation". According to the authors, Knowledge Management and learning organization are not able to be dissociated from innovation.

1.2.Value-chain of creativity

Indeed, market is not only formed by your direct customers but includes their own customers and among those various customers (or even prescriptors or consultants), you may find wholesalers,brokers, dealers, concessionaries, servicemen, contractors, subcontractors and final users, each one having his own needs and goals; among users, you may distinguish those who use your product for themselves and those who do it for somebody else; moreover, you have to take into account the context of use, namely if your product (existing or potential) is jointly used with another one. If your product is used as a tool -a car is a tool for the motorist who uses it to go from one place to another-, you have to consider its purpose, which wants it supplies and in which way it is used. It is very difficult to speak about such a subject in a general way. So, to design an innovation, you have to take into account the whole value chain and not only focus upon the future product itself. Frequently, the value chain shows several bifurcations; at some point of the chain, there is your company and at the end, there are markets (applications/customers).

This is very difficult to depict because it is generally a complex world with many clusters. The best way to be computer-assisted seems to use K-Maps. One interest of them is the possibility of anticipating future realizations even if they do not yet exist and they facilitate metaphoric thinking. Do you think that the scientist who discovered Laser-effect was able to forecast such different applications of it such as DVD, bar-code reading, fine metal punching, cloth cut or eye care? In consequence, if it is not sufficient to investigate the world of designers and users (company and markets -in the plural-), it will be necessary to

associate to them representatives of the research community. I know it is a hard task because speculative searchers are not always interested in practical problems; so you must find out some open-minded scientists or facilitators. This scientific quest is important because there are latent needs which are never uttered for want of imaginable solution. Moreover, you will have an uninterrupted coming and going between laboratories and markets because an application in a given field may sometimes be transposed into an application in another field after it has been re-thought by the scientists. Thus, let us say that there is a connection between "new knowledge" -coming from the laboratory- and "human capital". The role of the innovator is to coordonate the different actors via a network, a portal and collaborative platforms; his dashboard could be a collection of K-Maps.

To the question "Who innovates? The Company or the Market?", it is possible to answer:

- The company (unless the innovation is subcontracted)
- The markets (in the plural)
- The laboratory (at the origin of the discovery, if not inside the company)
- The innovator himself (for he has a specific role).

If your Company wants to innovate in order to remain competitive, it must start from a knowledge base. This base may be internal or external; it generally depends on the degree of theoretical content and the nature of knowledge –whether it is codified or tacit-. Scientific knowledge is more often codified whereas engineering one is rather tacit when it lies on know-how and experience. If sometimes innovation results from a sudden insight (penicillin discovery, Post-it ® first idea…), such cases are more and more seldom; innovation has to be embedded into a genuine strategic plan taking into account the specificity of the product to be brought to the market. If you look at the 2006 Report (8) of AUTM ®, you will learn that only during 2005, 4932 new licenses were signed between american universities and

companies and 527 new products introduced into the market as a result of applications of fundamental research such as a nano-printing press based on nanometer-scale technology of materials and processes as an alternative to expensive optical lithography tools or a process based on surface charges properties applied to coagulation-filtration for removing heavy metals from drinking water. Indeed thre are many examples of scientific discoveries having led to new technology-based products such as “Lucent Tecchnologies’ Bell Laboratories fundamental studies of non linear optical processes [which] led to the invention of optical fibers engineered for greatly reduced chromatic dispersion” (9).

Thus, an innovation state-of-mind has to start from theoretical research and extend to business concerns (manufacturing at low cost, marketing and distribution channels), the last stages allowing a return on the investment incurred by the first stages Only an holistic attitude may ensure a regular flow of innovating products to a firm so that you have to imagine a pipe-line with an input of basic research and an output of new products (and corresponding profits). We insist upon the fact that the chain must be complete because without serious theoretical basis you may lack of means to succeed in delivering a satisfying product and without caring for commercialization you may go beside return on your investment and spent time.
It is true that you need basic research even for very popular products. You will find a good example in the “American Competitive Initiative” booklet (10) which shows how MP3 devices are indebted to

. thin-film metallic multilayers which led to magnetoresistive effect used in micro hard drive storage
. electrochemistry which gave rise to lithium-ion batteries
. liquid crystal which opened the way to transistor LCD display
. fast Fourier transform allowing signal compression.

The main issue is how to access to the knowledge which generally originates from research institutions. Karan J. Sorensen (11) distinguishes

. absorptive capacity (in-house basic research, publications, patents,
conferences, exhibitions and so on)
. connectedness (direct exchanges through meetings, networks, CoPs,
reciprocal visits, research consortia and so on)
. collaborative research which we shall examine further.

Whatever method you use, Knowledge Management is a must to share the information and any how, as Sorensen underlines it, it is very important to identify the “Thought leaders” in your own field. Collaborative research is at the source of the main successful innovations and some firms designed very efficient methods as CISCO, in the frame of its “Emergent Technologies” with its internal entrepreneurship-minded start-up teams with external assigned persons or DEGUSSA with its “Project Houses”. One of them was described by Dr Andreas Gutsch, Head of Creavis Technologies & Innovation, Degussa A.G., for “NanoTech Day” on September 28, 2006. The problem encountered was the excessive heating of new batteries for hybrid cars; it was solved by a ceramic separator based on customized nanomaterials designed thanks to a platform working in collaboration with academic institutions during 3 years under the same roof, gathering academic scientists for their fundamental knowledge together with Degussa searcher for their technology experience and marketing knowledge. Let us observe that the market amounts to € 1,4 billions and will reach 3,9 in 2015. Such an initiative was well detailed at DECHEMA in Francfort ion May 29, 2006 (12).
Project Houses are new technologies platforms staffed by a 20-30
persons team with a budget exceeding € 15 millions and doomed to last 3 years, with a close cooperation with academia, the products or processes sprung from their research being commercialized within existing Business Units or through internal start-ups.

As you may see, innovation is no longer left to chance but it relies on long term project management leaning on a few selected domains: it implies a structuration with ad hoc commitees, regular meetings with agenda, visits of sites and so on. An important issue is the status of IP when several entities work together; this supposes that contractual relationships regarding the result of the research have been clearly defined (13) namely who will own the patent or benefit from its commercialization or industrialization, that communication between the members is guaranteed and that non-disclosure to third parties is required; the royalties if any have to be specified.

What is called the Fuzzy Front-End (FFE) by authors as Petre Koen (14) is the stage lying at the very beginning of the innovation process ; this process is generally considered as a funnel starting with ideas, followed by a development stage, a prototype stage if any, manufacturing and commercialization; each stage is separated from the preceding one by a screening in order to select valuable possibilities and take into account potential constraints. Whereas the innovating process has been thoroughly studied, the FFE is an ill-known creative process because it is quite unstructured and especially iterative though it is the most critical phase that the future actions depends on. To identify business opportunities, you have to know both the research capabilities and the customers needs but this is far from being explicit knowledge.
Indeed, the starting point itself is unsettled: you may start from the current research, external or internal, or from the market needs and the environment trends; you may expect an incremental innovation or a radical one; this stage may be limited to an individual without any instruction or extend to a team made up to fulfill a project. To our opinion, radical innovations are more research-generated and incremental ones more customer-generated though they are both for customer's sake. In fact, the quite initial concept begins to grow inside the heads of individuals and this is a permanent phenomenon. For this kind of individuals, the main purpose is being acquainted with scientific, technical and social events even if they have, as it

generally is the case, a function in the company of Marketing or Strategy Executive Officer. In practice, innovation begins mostly with a hint which will bootstrap the whole process until its successful closing or before in case its unworthiness should be recognized. Such a hint is not yet the “idea” referred to in some theoretical models (15) and is situated upstream: it is just an intuition according to which such or such field of basic research could be useful to the company in order to respond a need, either this need is explicitly uttered by customer or just latent (it is latent when users are only potential because people did not yet thought of it but would welcome the mean to satisfy it if it would be offered to them). From this moment, a sequence of actions has to be impulsed in an iterative way:

- study of scientific and technical literature
- identification of related patents and competition actions
- contacts with searchers and experts
- market investigations
- meetings with laboratories representatives in expectation of contractual relationships
- discussions with customers to collect their suggestions or imagine
their point of view
- statement of principles

If the innovation concerns a product made of several innovative components, the same steps have to be taken for each one after breakdown of the whole as in the case of MP3.
We did not allude to potential constraints about supplying, manufacturing, distributing and so on which are entered upon during the innovation process itself and which available models take into account. Various technologies may be used to help working up such processes located at the advanced posts of innovation: Knowledge Management and Business Intelligence for information gathering and methods of customers needs deepening such as “virtual future environment”(16).

1.3. Consequences for the offer's strategy

The scope of your offer has continuously to be reexamined and, if necessary, enriched or alleviated. Indeed, there is always something changing such as costs, competitors, customers requirements and needs. Reaction to those changes is a constraint and involves serious studies, both quantitative and qualitative ones. As Jamie Bonomo and Andy Pasternak state it, "gradual proliferation and resulting complexity ... obscure the profit contribution of any individual component" (17).

The offer of a supplier of products and/or services may be enriched in order to increase the turnover and the profit by attracting more customers or selling more to existing ones.Nevertheless, you have to be very careful when doing that because, if you don't do, you may obtain the opposite result of the one you expect. To enrich your offer, you may simply add new products and/or services or imagine a bundle including components being complementary in consideration of

- their use
- their place of consumption, working up or acquisition
- their link to a common application
- the benefit of a coordination of fulfilments in space and/or time
- the advantage of matching several items

On the contrary, the offer may be pruned by taking off some products and/or services which seem not enough or no more profit-earning or in which only a few customers are interested so that they cost more than they yield. But one has to be very careful in operating suppression namely concerning low-margin products for they may play the role of enticement or simply and solely be useful to customers that, if they no longer find them at a supplier, will shift elsewhere.

The determination of an offer involves

- accounting data which often are difficult to seize because of the numerous interactions and common charges to be imputed; moreover, you have to take into account a share of assets being used by the concerned product which is not directly to be found into current accounts but is the subject of CVP (Cost/Volume/Profit Analysis) including contribution margin analysis and individual customer profitability; a Balanced Score Card approach is another possibility (18)

- qualitative elements such as marketing oriented ones which may have an influence over the decision making of enriching or alleviating the offer

Thus, before modifying an offer in any direction, it is necessary to carefully study the consequences of a change as well at the cost level as at the profit level. Indeed, you must not limit your investigation to the direct consequences but you must imagine the indirect ones namely by means of “System Thinking”. It is possible to tackle the problem of impact by asking the following questions:

- What does this item costs and yields?
- What would a change modify as for value creation for the customer?
- Which are the consequences of altering the value creation for the customer from the supplier point of view?
- Does the consolidated balance of those three aspects justify or not the modification of the offer?

Once the decision is made in order to modify an offer, the consequences on supply and demand have to be supported:

- In regard to offer: supply, manufacturing, subcontracting, partnership agreements...
- In regard to demand: customer relationships, contracts, delivery methods, documentation, servicing, promotion...

You may be helped by software to compute cost shares or profit contributions of products and services but, concerning qualitative impacts it is more difficult unless you translate them intonumerical scores.And don't forget that there are numerous hidden impacts that sometimes you realize only once the product or the service has been launched or deleted; for instance, human intervention may be replaced by automated devices whereas man may add value to your offer, for instance through better relationship with customers or valuable information about local situation.

It's a good to remind us that we are double-faced with a "hard" side -analytical or rational which involves "Technical Credibility"- and a "soft" side - inductive or emotional called "Safety Credibility" by Lowell Steele-. This distinction is very important from the marketing point of view especially in the brand supporting. Let us recognize that is is not sufficient to supply technical solutions to solve customers' problems or satisfy their needs for they have to feel comfortable with their supplier and have cool relationships with the company they trust under the label of a brand.

Thus when you consider modifying an offer, in any case, you will have to take into account the possible repercussions on the brand (in some cases, brand is a kind of umbrella which shields other brands). So you must do whatever is necessary to have your brand known but at the same time preserve it in being blameless. Indeed, each time your company is liable to bad practices, this is a more or less great part of its brand asset which is destroyed; the more your brand is known, the more the damages are important and long to rub out. At the beginning of a brand, you start from something rather popular and then enlarge it, keeping the same spirit for this is an emotional seed. Generally,the brand

does not represent a specific product but a company, its values and ideal; it suggests something like a model or an icon which lies inside the minds: that is why the best success driver of a brand is the reputation of the company it belongs to. You will ask: What is reputation? It is what people perceive about and expect from a firm. They may feel more or less drawn to it but this feeling may be altered by any behaviour according as it is consistent or not with ethics or the image you have of it.

Reputation is a factor of performance (19) but it includes many components such as CEO's personality, management excellence, communications (PR), human relations, customers care, environment respect,relationships with each kind of stakeholders and performance. Reputation is very difficult to safeguard in case of crisis during which the risk is at its utmost: the greatest transparency is preconized but every possible effort has to be worked out for reputation is a very valuable intangible asset. Offer of products and services has to fall in with some consistency to be credible. But its attractiveness is not only the consequence of its components themselves but depends on the firm's reputation. The reputation results from the opinion of the stakeholders echoed by various media. It is true that the firm's offer attracts more or less customers and that not only products but associated services attract them the more because sometimes services increase customers intimacy and control, according to Industry Directions Inc. (20).

Services include installation, spare parts delivery, hotline, maintenance, training, consulting, end-of-life disposal, refurbishment, renting, returns and warranty. They may be extended to a genuine collaboration especially in the design field which often takes place in high-tech industry. Reputation is generally associated with a brand which, as Professor Guenther Mueller-Heumann (21) says, "is a silent salesman". Indeed, brand is a short-cut of what the firm represents in the mind of customers so that its power may be used for licensing. So it is clear that building trusting is not only the result of

PR (announcement or promises) or even CRM (knowledge of customers) but has to be dealt with by an independent Reputation Management (keeping promises,tuning and dialogue) for which computer assistance is supplied, for instance, by Pivotal's software (22). Its role is to match on one hand the firm's character and behaviour, on the other hand the expectation of stakeholders; it is not limited to crisis situations but extends to risk management; in fact, reputation-linked risk is not always included into ERM (Enterprise Risk Management) as it ought to be. As it is described in an article from Harvard Business Review (23), risk depends on expectation-reality gap. The authors describe the various stakeholders (investors, customers, suppliers, employees, communities and so on), the different categories of subjects contributing to the reputation of the firm (quality, performances, governance, environmental and social issues and so on), the corporate functions and their relationships with stakeholders (such as Investors Relations with Investors, Marketing with customers, HR with employees, Communications with medias and so on). Reputation Management coordinates those relationships so that they would not contradict one another. This gives rise to a permanent effort because an unfavourable event or rumour may call in question the most long established reputations. That is why it is recommended to measure the expectation level after published stories by the press -either positive or negative-; thus, you can use a dashboard visualizing whether you meet targets.

In spite of the necessity to take care of every stakeholder, customers are at the core of the strategy of the firm and relationships with them are preponderant (24) and simple customer satisfaction evolved to customer relationships and afterwards to "Customer Advocacy or Advocacy Relationship Development which implies a mutual dialogue between single customers and the firm that maximize the customers interest over the available products".

A trust-building strategy is based upon a continuous and consistent reputational risk management which includes not only products but numerous issues inside and outside the firm.
The frontier between products and services is more and more blurred owing to the growing requirements of customers and under the pressure of competition which drives differentiation.
A first trend is the transition from a pure product considered as a tool or a simple commodity to a more complex prestation including other products and services creating value for the customer -and, of course, simultaneously for the provider-.
Another trend is the adjunction of a proposal of products to an offer of services implying the use of tangible goods either as tools or material.

1.4. Global supply

A Global Supply is a mixture of products and services which responds to the specifications of a customer. To propose a competitive Global Supply, you have to possess

- a good knowledge of the market with a customer oriented Knowledge Management linked with CRM and one-to-one dialogue means
- multiple specialized competencies and learning capabilities
- an accurate sense of yield management
- a perfect organization coping with unique interlocutors for the customers

Let us just underline here the new type of organization necessary to manage a Global Supply; the specialization of Business Units in types of manufactured or distributed products is no longer pertinent and has to be replaced by a specialization in types of applications. We may consider a first Business Unit as the “Main Core” one: it is devoted to the basic (or intermediary) products themselves, either manufactured or only distributed by the firm. Beside this Main Core B. U., there will be “Secondary Cores” B. U; corresponding to different applications of the Main Core or to end

products using products of the Main Core as components. In addition, you will have auxiliary B. U. adding common fulfilment (such as delivery, packaging, renting and so on) to the other B.U.'s ones. Every B. U. will work with its own means or in connection with external suppliers but will keep playing a leading role in its field of competency. In such a context, concerning the Main Core, there will be a permanent quest for new technologies so that the firm would not be surprised by an unforeseen revolution; Besides, it is quite possible to manage several Main Cores as a portofolio but it must be defined in the frame of a clear strategy. Concerning the Secondary Cores, a rigorous Knowledge Management will permanently care for new potential applications or integration in connection with searchers either from institutions or internal RID. These cores may be fed by the concrete activity of customers, especially the ones who directly buy to the Main Core in so far as this activity does not yet match with a secondary core B. U. 's purpose. The cores are to be considered as poles of excellence and comprise highly acute competencies as well as various tests and demonstration means.

An unique front-end interlocutor of a customer is the coordinator of the B. U.s (and their sale forces) ensuring the Global Supply of this customer; at the same time, he will be a good and impartial adviser of the customer if it is necessary; moreover, he will be an observer of the way the customer uses the supply of the firm and will bring back new ideas of Global Supply (with eventual suggestions about creation of new secondary or common cores.
The front-end interlocutor's principal role is the delivery of the right Global Supply to the customer.

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2. Knowledge and innovation

2.1. Innovation culture

The creation of products and/or services passes by a true partnership connecting the creativity of the manufacturer or service provider with the customer requirements rising from the practice from his business or a use repeated in its particular context.

The Web makes it possible to better handle the data as those which collects, for example, Apple which makes the most of therequests carried out on hot-line, Levi Strauss which uses the data of industrial measurement or Kellog which studies the requests for dietetic information, as indicates it R. McKenna in an article of"Harvard Business Review" of July-August 1995, entitled "Real Time Marketing" (Ref.: §1.1) one can just as easily quote the manufacturers of vehicles which provide to their dealers a data processing assistance with the diagnosis of breakdowns and which learn from them the lessonsnecessary to the improvement of their products. The organization in network makes it possible the various stakeholders to dialogue as early as the stage of design of the product and even, in certain cases,during its use, which makes it possible to design and possibly modify the product in connection with the customer; that also makes it possible to conceive the means of production with the operators who will have to use them and to train these operators in connection with the designers. The designer (or the design team) is placed in the center of an informational device which puts him in relation with the end-user and the manufacturing operator. That enables him to develop a virtual product, a virtual machine (or a process of manufacturing), tools of assistance to the training of the operators. In order to avoid any ambiguity thereafter, let us

specify that when we speak about organization in network, we refer to as well only one company comprising various centers of profit or autonomous units as a number of distinct companies working together on a contractual basis and taking up quite precise duties, some of them being able even to exert the same function and to enter in competition, as it is the case in the market places.Moreover, the innovation does not develop within the strict limits of a given function possibly constituting, at a given moment, a point of focusing but is diffuse through the very whole organization with the proviso of finding there a climate favorable carefully prepared and maintained by every direction and more particularly by omnipresent Human Resources Officers; the staff is then characterized, as we recommend it in our work entitled "L'entreprise délocalisée",by "his aptitude to work in team, to act and report, to get information and inform, learn and teach, listen and dialogue with his colleagues, to be able to create, maintain and develop his own network of relations". The problem consists in collecting the ideas of innovation to implement them within the adequate function, whatever their origin and that by an incremental development inspired of the "kaizan" appraised by Japanese people. According to Walker, in a report of the RAND Corporation, this joint development is at variance with the" take or leave it" attitude when a manufacturer speaks to a customer or the "show and tell"one when a foreman speaks to an operator. That can involve particular organizations such as Russel L. Ackoff’s democratic corporation (Ref.: §1.1).

2.2. Understanding the market

Indeed, market is not only formed by your direct customers but includes their own customers and among those various customers (or even prescriptors or consultants), you may find wholesalers,brokers, dealers, concessionaries, servicemen, contractors, subcontractors and final users, each one having his own needs and goals; among users, you may distinguish those who use your product for themselves and those who do it for somebody else; moreover, you have to take into account the

context of use, namely if your product (existing or potential) is jointly used with another one. If your product is used as a tool -a car is a tool for the motorist who uses it to go from one place to another-, you have to consider its purpose, which wants it supplies and in which way it is used. It is very difficult to speak about such a subject in a general way.

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- The innovator himself (for he has a specific role).

2.3. Knowledge base

If your Company wants to innovate in order to remain competitive, it must start from a knowledge base. This base may be internal or external; it generally depends on the degree of theoretical content and the nature of knowledge –whether it is codified or tacit-. Scientific knowledge is more often codified whereas engineering one is rather tacit when it lies on know-how and experience.

As we already observed it, innovation has to be embedded into a genuine strategic plan taking into account the specificity of the product to be brought to the market. The main issue is how to access to the knowledge which generally originates from research institutions. Karan J. Sorensen (1) distinguishes

- absorptive capacity (in-house basic research, publications, patents,
conferences, exhibitions and so on)

- connectedness (direct exchanges through meetings, networks, CoPs,
reciprocal visits, research consortia and so on)
- collaborative research which we shall examine further.

2.4. Collaboration role

Whatever method you use, Knowledge Management is a must to share the information and any how, as Sorensen underlines it, it is very important to identify the "Thought leaders" in your own field. Collaborative research is at the source of the main successful innovations and some firms designed very efficient methods as CISCO, in the frame of its "Emergent Technologies" with its internal entrepreneurship-minded start-up teams with external assigned persons or DEGUSSA with its "Project Houses". One of them was described by Dr Andreas Gutsch, Head of Creavis Technologies & Innovation, Degussa A.G., for "NanoTech Day" on September 28, 2006. The problem encountered was the excessive heating of new batteries for hybrid cars; it was solved by a ceramic separator based on customized nanomaterials designed thanks to a platform working in collaboration with academic institutions during 3 years under the same roof, gathering academic scientists for their fundamental knowledge together with Degussa searcher for their technology experience and marketing knowledge. Let us observe that the market amounts to € 1,4 billions and will reach 3,9 in 2015. Such an initiative was well detailed at DECHEMA in Francfort ion May 29, 2006 (2).

Project Houses are new technologies platforms staffed by a 20-30 persons teeam with a budget exceeding € 15 millions and doomed to last 3 years, with a close cooperation with academia, the products or processes sprung from their research being commercialized within existing Business Units or through internal start-ups.

As you may see, innovation is no longer left to chance but it relies

on long term project management leaning on a few selected domains: it implies a structuration with ad hoc commitees, regular meetings with agenda, visits of sites and so on. An important issue is the status of IP when several entities work together; this supposes that contractual relationships regarding the result of the research have been clearly defined (3) namely who will own the patent or benefit from its commercialization or industrialization, that communication between the members is guaranteed and that non-disclosure to third parties is required; the royalties if any have to be specified.

2.5. Bootstrapping the process

What is called the Fuzzy Front-End (FFE) by authors as Petre Koen (4) is the stage lying at the very beginning of the innovation process ; this process is generally considered as a funnel starting with ideas, followed by a development stage, a prototype stage if any, manufacturing and commercialization; each stage is separated from the preceding one by a screening in order to select valuable possibilities and take into account potential constraints. Whereas the innovating process has been thoroughly studied, the FFE is an ill-known creative process because it is quite unstructured and especially iterative though it is the most critical phase that the future actions depends on. To identify business opportunities, you have to know both the research capabilities and the customers needs but this is far from being explicit knowledge. Indeed, the starting point itself is unsettled: you may start from the current research, external or internal, or from the market needs and the environment trends; you may expect an incremental innovation or a radical one; this stage may be limited to an individual or extend to a team made up to fulfill a project. In our opinion, radical innovations are more research-oriented whereas incremental ones are more customer-generated though they are both for customer’s sake. In fact, the quite initial concept begins to grow inside the heads of individuals and this is a permanent phenomenon. For this kind of individuals,

the main purpose is being acquainted with scientific, technical and social events even if they have, as it generally is the case, a function in the company of Marketing or Strategy Executive Officer.
In practice, innovation begins mostly with a hint which will bootstrap the whole process until its closing or before in case its unworthiness should be recognized. Such a hint is not yet the "idea" referred to in some theoretical models (5) and is situated upstream: it is just an intuition according to which such or such field of basic research could be useful to the company in order to respond a need, either this need is explicitly uttered by customer or just latent (it is latent when users are only potential because people did not yet thought of it but would welcome the mean to satisfy it if it would be offered to them). From this moment, a sequence of actions has to be impulsed in an iterative way:

- study of scientific and technical literature
- identification of related patents and competition actions
- contacts with searchers and experts
- market investigations
- meetings with laboratories representatives in expectation of contractual relationships
- discussions with customers to collect their suggestions or imagine
their point of view
- statement of principles

If the innovation concerns a product made of several innovative components, the same steps have to be taken for each one after breakdown of the whole as in the case of MP3 (Ref.: §1.2).

We did not allude to potential constraints about supplying, manufacturing, distributing and so on which are entered upon during the innovation process itself (namely, during screening) and which available models take into account.

Various technologies may be used to help working up such processes located at the advanced posts of innovation:

Knowledge Management and Business Intelligence for information gathering and methods of customers needs deepening such as "virtual future environment" in a contextual situation (6).

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Perceived Issues with University-to-Industry Knowledge Transfer, Stevens Institute of Technology/Wesley J. Howe School of Technology Management, Hoboken (NJ)
(2) Prozessintensivierung bei Degussa: Bessere Prozesse plus neue Produkte, Infotag, Prozessintensivierung-Ansichten der Industrie, DECHEMA, Frankfurt, 29 Mai 2006
(3) Jean-François Bretonnière, Cécile Cailac, From Innovation to Commercialization 2007, Key IP issues in collaborative research in France, Baker & McKenzie, Paris, A Supplement to Intellectual Asset Management magazine (iam), February 2007
(4) Peter Koen, Tools and techniques for managing the front end of innovation, Highlights from the May 2003 Cambridge Conference
(5) Prof. Dr Bernhard R. Katzy, How to Make Innovation Happen?, University of Leiden, Center for Technology and Innovation Management, 19 april 2005,http://www.CeTIM.org/wps
(6) Dahan and Hauser, Working Paper, MIT, Center for Innovation in Product http://mitsloan.mit.edu/vc

3. Emergent strategies and virtual enterprises

3.1. New management behaviour

Owing to an article of Dann and Barclay (1), complexity involves a “management based on knowledge collection and its transformation” through “organization of people and activities” - that is “well trained and informed people” and encouraging informal groups”- to extract maximum value that is ”transforming knowledge into marketable products and services”.

Indeed, at the era of knowledge economy, management has a double aspect; to borrow the terms used by Thomas A. Stewart (2) it has to take care both of a “machine” and of a “garden”. This attitude of mind is referred to as an “emergent strategy” contrary to the classical ”deliberate” or “intended” strategy.

The emergent strategy “emerges” from a “garden” which has to be sowed, cultivated and harvested. It is not workflow-defined but human-centered. Human capital is indeed a very valuable asset and it is worth being solicitous about it. It is mentionned in many dashboards such as Kaplan & Norton’s balanced scorecard, Sveiby’s Intangible Asset Monitor or Skandia’s Navigator.

You find into them economical, organizational, relational, human and educational items. The educational one seems the one which may be used to obtain the state of mind complying with the so-called emergent strategy. The problem is that in every system you measure quantitative measurements but nobody tells you why you have people learning, what they learn and what they acquired by means of this learning. You just suppose that, as the great objectives are interlinked, the improvement of your ROI (if any) is partially indebted to this learning effort! It is quite unavailing.

So, we have to determine what people have to learn to be able to contribute to the global strategy through a useful and if possible innovative emergent strategy. How to make so that the company, primarily made up of individuals having each one its aspirations and its characteristics, behaves like a single organization having itself its own originality and its finality, even if one considers that it is with the service of the individuals who make it up and his various partners - among whom figures community-? Is it allowed to speak about collective intelligence – thus distributed without a centralization implying a determination of the objectives and the manner of reaching them by top-down instructions ? On another side, which freedom of action remains with the actors of the company when no initiative is encouraged even tolerated on behalf of those which do nothing but carry out instructions elaborated or transmitted by the hierarchy? It is difficult to imagine a company innovating and able to react quickly to the external requirements and changes of the environment, whatever their nature: commercial, technological, legislative or social and their geographical impact, without a suitable organisational structure, a favorable state of mind and a cultural context being set up.

The conditions to fill will have to thus allow

- initiatives to express itself like consequence of the immersion of the whole of the agents in a regular flow of knowledge as well ”pushed” as “drawn” leading those to react to any dysfunction

or signal even “weak”of change
- problems to be solved and decisions to be made quite transparently and within a collaborative framework or a project management structure

That supposes nevertheless an essential prerequisite: the staff has to be be trained and involved to act in accordance with the collective interest. For that, beside usual continuous training aiming at updating the trade-oriented knowledge, the staff needing it will receive a general initiation on aspects financial, economic, social, environmental and so on as well as on the strategic objectives specific to the company as well as on the various methods of decision-making and the data-processing assistance which is associated to them.

3.2. Collective intelligence

At this stage of our reflection, we may assert that innovation as well as collective reflection (based upon distributed intelligence) depend on a specific state-of-mind which is to be flourishing only in a context of some freedom. In order to tap this distributed intelligence, you have to let people utter their opinion by means of networking and collaborative tools; moreover, you have to create the psychological and sociological conditions to enhance this utterance. People have no longer to hide their initiatives (until they are mature... and successful) but must unveil them at the beginning without fearing being blamed for not complying with the hierarchy.

Now, let us look how it could work in the case of a collective reflection. From the organizational point of view, you have to use collaborative platforms which generally help project leaders managing a project or a portofolio of projects, take care of as well work realized as the knowledge acquired in the shape of various documents, in a genuine traceable way. But an issue of prime importance is how you progress from the first statements to the final conclusion. To accomplish this, you need to create and use

some concepts buoying out the rationale and suitable to your own context.

An important issue is the level at which the collaborative intelligence has to be practised; of course, the whole (extended) firm may be concerned but in this case, would it be possible to imagine a fractal structure of projects. Moreover, is it possible to implement a collective intelligence oriented proceeding into a centralized organization insofar as you apply solutions like the above suggested ones?

3.3. Virtual enterprise

A way of tackling complexity is the implementation of so-called « virtual enterprises »; a virtual enterprise is a whole generally made of several independent enterprises attempting to reach a common goal which is mostly temporary whereas behaving, seen from outside, as a unique enterprise; its management may be centralized but it is more often distributed -that is hosted inside each participating firm-. Each partner has one or several definite roles and one of them may have a leadership or at least is initiating what may be considered as a project. The organization is virtual but of course the resources are well real. The virtual enterprise is distinguished by its management, its networking and ICT specific tools.

From the management point of view, it is useful to discriminate the strategic side from the operational one. The strategic point of view is namely related to the opportunity of entering a virtual organization, to the choice of partners (not always the same for different missions) and to business rules; the operational one concerns the tasks to be achieved, the roles assignment, intellectual property agreements and so on.

At the present time ICT tools exist for integrating, collaborating, networking (including social capital improving), knowledge management (human capital) and competencies sharing -as well as for programmable tasks and processes as non-programmable

ones-, planning, ressources acquisition, monitoring; standards are appearing for specifically dealing with virtual enterprises concerns such as modelling, unifying partners processes and various services (standard procedures) such as relationships between partners supported by XRM (eXtended Relationship Management) (3) (4) (5)

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4. FROM RANK TO PEER ORGANIZATION

4.1. GOALS AND ROLES

We are accustomed to traditional organizational charts which reserve a place to individuals according to the level and the kind of task for which they were hired; when an employee leaves the company, another one generally takes his place in order to fill the gap. In this way, the organization offers always the same structure and change is not an easy matter –insofar that somebody cares for it-.

The principle of most organizational charts is “one task, one man” and it is extended from the bottom to the top. This leads to a work partition which is not always compliant with a good consistence and unique alignment on strategy. Everybody heard of stories (not success ones) about the divergent actions of the Marketing Manager and the Sales Manager (about product scope), the Financial Manager and the Sales Mannager (about inventories level), the Technical Manager and the Sales Manager (about batches size) and so on.

It may be necessary to think of goals before roles and the goals may be grouped into a few basic clusters such as:

- (A) scientific and technical
- (B) commercial and marketing
- (C) administrative and social
- (D) economical and financial

After that, you may think of operations such as the ones you may find in any quality manual; for instance

- (A) design and development, product realization
- (B) customer-related processes
- (C) resource management
- (D) measurement analysis and improvement

There are some analogies with scorecard practice concerning

- (B) CUSTOMER
- (D) FINANCIAL

but it is difficult to compare (A) to LEARNING AND GROWTH and (C) to INTERNAL BUSINESS PROCESS; in fact, scorecard items are performance-oriented.

Then you may come back to occupational concerns such as those of the US Department of Labour for managing occupations:

- (A) Operations specialties: Industrial Production
- (B) Advertising, Marketing,Promotions, Public Relations, Sales
  Operations specialties: Purchasing
  Transportation, Storage, and Distribution
- (C) Operations specialties: Administrative
  Human Resources
- (D) Operations specialties:Computer and Information Systems
  Financial

Starting from the goals (according the leading strategy) , we shall define the roles in a cluster frame, then we could specify the occupational positions and then state the performance indicators.

To define the roles we may call for a method prompted by Value Analysis (1). It is generally used to define new products in order to evaluate each function with regard to the genuine needs of the user and the cost it implies.The aim is to satisfy the customer neither less nor more than what he expects for his expense and at the least cost for the supplier. For this purpose, you have to scrutinize each component or subsystem, estimate its contribution to the value of the product and its cost share.

Similarly, we could do something like that to analyze functions, especially managerial ones, starting from the goals and the tasks to be done, as well as the deliverables within a defined period and the necessary resources (2).

4.2. COLLABORATIVE DECISION MAKING

In the labour field, we are interested in human resources and peculiarly competencies. The problem is to state: Who or which group or team will do the work and to whom will it report? You may find insight about a method after the study of City University (3): it unifies objectives statement, performance indicators, competencies, management role, performance assessment and individual development.

We recognize that the cluster organization we suggested is not sufficient to entirely avoid siloing for it remains a need for linking clusters together but this could be realized by teams including representatives of each cluster.

Such teams could be permanent or temporary according to their purpose; but the main role of these teams is to help making decisions. As Professor Nielsen asserts “By denying no one the chance to make decisions about issues affecting his or her work, it will increase everyone’s productivity and lower costs.” (4), opposing Peer Thinking to Rank Thinking.

Teams will become more and more at the core of decision-making inside complex organizations because change is fast, competition acute, technology evolving, environment uncertain. Professor Nielsen’s concept implies peer-based councils, networks of councils, rotational leadership based on peer review, teamwork and knowledge sharing.

In fact, on one hand, the collective thinking is significative only if you have a sufficient number of participants because of the necessary diversity of points of views, experiences, competencies and opinions, on the other hand, it is difficult to coordinate plethoric groups; this leads to maintain teams of reasonable size which is very context-dependent (it is said that 50 to 75 individuals is a good number on condition that you would be able to divide them into smaller groups of about 8 for more focused discussions).

A mean of solving the above contradiction is to adopt a hierarchy of teams having not a rank role but simply a logical one linked to the level of issues to be tackled, upper levels comprising delegates of lower ones.

4.3 TOWARD A NEW CULTURE

Everybody can imagine the best organization being suitable to his environment but the difficulty is to bring together the psychological requirements leading to employees involvement. This point is well underlined by NCEO (5) with examples such as W. L. Gore & Associates, a 8,000-associates owned company (“no manager, no job title, no hierarchy, no reporting rules”);

this is an extreme example but it is typical of the team building on the initiative of any employee on condition that some agree with joining, the leadership of the team being devoted to the most skilled for a given time.

The collaborative work is often compared with the collective action of ants, bees, birds or herrings but we must notice that man is different namely because he has other concerns than the elementary instinctive drivers of those populations and because he is not only guided by a collective motivation; thus, if you want to obtain a collective behaviour, you have to introduce incentives (stock ownership plan, rewards) and create propitious conditions (open-book management, training, information sharing).

In fact, it is very difficult to obtain good teams that is teams where people feel well together and which offer the necessary diversity. Before doing that, you have to create a good social climate, an enterprise culture with clearly stated and practised values and a prime information system including an adequate knowledge management.

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